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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/033,950	12/28/2001	Jurgen Ziegler	1999P8173	8578

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LERNER AND GREENBERG, P.A.
PATENT ATTORNEYS AND ATTORNEYS AT LAW
Post Office Box 2480
Hollywood, FL 33022-2480

EXAMINER	
LUU, THANH X	
ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 07/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Offic Action Summary	Application No.	Applicant(s)	
	10/033,950	ZIEGLER ET AL.	
	Examiner	Art Unit	
	Thanh X Luu	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,11-13,16,17,19 and 20* is/are rejected.

7)☒ Claim(s) *8-10,14,15 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 December 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the at least two sensor elements of claim 18 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 3 is objected to because of the following informalities:

In claim 3, "the light beam" lacks proper antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-6, 12, 13 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Kleinknecht et al. (U.S. Patent 4,141,780).

Regarding claims 1-6, 12. 13 and 19, Kleinknecht et al. disclose (see Figure 4) an apparatus for monitoring layer depositions in a process chamber, comprising: a light

source (32); a sensor element (10) subjectable to deposition and growth of a deposition layer; a light detector (38); the sensor element having a region (12) configured to absorb light to a significantly lesser extent than a remaining part of the sensor element, wherein an intensity of the light is measured in dependence on the region being grown over by a thickness of the deposition layer. In addition, Kleinknecht et al. disclose (see Figure 2) the region is a continuous opening (a groove 16) in the sensor element. Kleinknecht et al. also disclose (see Figure 2) the region is configured to influence the intensity of a light beam measured by the detector as the thickness of the layer grows on the sensor element and (see Figure 4) the detector is disposed outside the process chamber (28) and the intensity of the light source is measured through a window (30) formed in the process chamber. Kleinknecht et al. further disclose (see Figure 4) the light source (32) is a separate light source generating a light beam and the light source is disposed in front of a window (30) formed in the process chamber (28) in a line with the sensor element (10) and the detector (38). In addition, Kleinknecht et al. disclose (see Figure 3) the region (12) is formed with a spatial extent in a same order of magnitude as a maximum layer thickness to be determined with the apparatus.

5. Claims 1, 11 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawai et al. (U.S. Patent 5,200,021).

Regarding claims 1, 11 and 17, Kawai et al. disclose (see Figure 8) an apparatus for monitoring layer depositions in a process chamber, comprising: a light source (23); a sensor element (6) subjectable to deposition and growth of a deposition layer; a light detector (16); the sensor element having a region (1) configured to absorb light to a

significantly lesser extent than a remaining part of the sensor element, wherein an intensity of the light is measured in dependence on the region being grown over by a thickness of the deposition layer. Kawai et al. also disclose (see Figure 8) a further detector (28) for measuring the intensity of the light from the light source not influenced by the sensor element and the sensor element is provided with a heating device (8).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai et al.

Regarding claim 16, Kawai et al. disclose the claimed invention as set forth above. Kawai et al. do not specifically disclose a cooling device. However, Kawai et al. teach (see column 4, lines 42-45) that temperature control is essential in providing an appropriate deposition environment. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to heat or cool the sensor element in the apparatus of Kawai et al. to obtain the desired temperature for proper operation.

8. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Kleinknecht et al. or Kawai et al. in view Chen et al. (U.S. Patent 6,071,375)

Regarding claim 7, Kleinknecht et al. or Kawai et al. disclose the claimed invention as set forth above. Kleinknecht et al. and Kawai et al. do not specifically disclose the light source as plasma. Chen et al. teach (see column 1, lines 40-45) using illumination from plasma to monitor etching or depositions. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide use plasma as a light source in the apparatus of Kleinknecht et al. or Kawai et al. to reduce the costs of providing an additional and separate light source.

Regarding claim 20, Kleinknecht et al. or Kawai et al. disclose the claimed invention as set forth above. Kleinknecht et al. and Kawai et al. do not specifically disclose determining a cleaning cycle time based on the measurements as claimed. Chen et al. teach (see column 2, lines 1-20) measuring a cleaning process. Thus, Chen et al. recognize that the apparatus requires cleaning for better performance. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to determine when cleaning is required in the apparatus of Kleinknecht et al. or Kawai et al. by examining the measurement signals at a maximum or minimum point in order to know when to proceed to cleaning and thereby improve the operation of the device.

Allowable Subject Matter

9. Claims 8-10, 14, 15 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: an apparatus as claimed, more specifically in combination with tilting or rotating the sensor element out of a beam path of the light or providing a disk-type sensor with a diameter of the region or opening that varies, or measuring the intensity of the light transmitted by at least two sensor elements, is not disclosed or made obvious by the prior art of record.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is (703) 305-0539. The examiner can normally be reached on Monday-Friday from 6:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta, can be reached on (703) 308-4852. The fax phone number for the organization where the application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

txl
July 2, 2003

Thanh X. Luu
Patent Examiner